

REMARKS

Claims 1-10 are present in this application. Claims 11 and 12 have been canceled.
Claims 1 and 7 are independent claims.

Allowable Subject Matter

Applicants wish to thank the Examiner for indicating that claims 7-10 are allowed.

Claim Rejection under 35 USC 103(a) – Warashina

Claims 1, 5, 6, 11, and 12 have been rejected under 35 U.S.C. 103(a) as being unpatentable over JP 09-105809 (Warashina). Claims 2-4 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Warashina in view of JP 2000-105310 (Sakamoto).

Applicants have amended claim 1 and canceled claims 11 and 12. Applicants respectfully traverse the rejection based on the claims as amended.

In particular, claim 1 has been amended to incorporate features deemed allowable in claim 7. Applicants submit that for the reasons that claim 7 is allowable, claim 1 should be considered allowable as well.

Summary of the Invention

According to the present specification, there are several approaches to formation of colored layers, which are listed in paragraph 0017. In a “pigment dispersion method,” colored pigment is dispersed into resinous material in advance. The resinous material containing the dispersed pigment is then spread over the surface of a glass substrate so as to form a thin film. In a “dry film lamination” method, a colored resist material is previously formed into a thin film

before bonding the colored thin film onto the surface of a glass substrate. The present invention solves problems related to the dry film lamination method. Claims 1 and 11, for example, recite, “bonding a colored film,” which indicates that a colored film had been previously formed.

The “dry film lamination” method typically first forms colored layers, followed by formation of the resinous black matrix (para. 0020). This sequence prevents foaming from being generated. Resinous black matrix material is also inserted into the gap between individual colored layers. It has been found that disorder in orientation will be observed at the junction between the resinous black matrix and the color layers (see portions 9 in Fig. 2). In the case of the “pigment dispersion method,” colored layers are superposed to overlap part of the resinous black matrix to cause the disordered orientation in the black matrix material to be concealed (paragraph 0022). However, if colored layers are formed to overlap part of the resinous black matrix in the case of the “dry film lamination” method, foaming is generated at the interface between the substrate, the resinous black matrix, and the pasting material (see foaming 11 in Fig. 4). Foaming can lead to a discolored portion of the colored layers (para. 0023).

In order to solve the discoloration problem that occurs in forming colored layers using the dry film lamination method, the method includes a step of forming beforehand a height difference in the resin black matrix so that an edge portion of the resin black matrix located on the upstream side with respect to the direction in which the colored film is bonded is made lower than the other portion of the resin black matrix (e.g., Fig. 5; para. 0026).

Warashina

Warashina is concerned with solution of a problem that, in a conventional color filter, when colored layers are formed on a resin black matrix, the colored layers swell on a portion

where the colored layers overlap the resin black matrix (Fig. 12d), and the flatness of the color filter surface is impaired, leading to easy disruption of the orientation of liquid crystal molecules and degraded display quality (Paragraphs 0045 - 0046 of Warashina). According to the conventional technologies, this problem can be solved a) by using a two-layer chrome, which is thinner than the resin black matrix, as a black matrix material in order to improve the flatness of the color filter (Paragraph 0047) or b) by applying an overcoat on the color filter in order to improve the flatness (Paragraph 0050).

Warashina proposes methods that are alternatives to a) or b) above (Paragraph 0054). In particular, Warashina discloses:

1) Formation of colored layers by a "pigment dispersion method" (paragraphs 0062 - 0073, Fig. 2 of Warashina)

In the pigment dispersion method, a colored layer mask pattern 3 is first arranged by patterning on an opening portion (12 in Fig. 3) and on edges of a resin black matrix 7 (Fig. 2a). Here, the outer edges of the colored layer mask pattern 3 are in a minute wave form. Next, a colored layer 6 is formed by the pigment dispersion method in an area where the mask is not applied (hatched area in Fig. 2a). Then photosensitive resin in the pigments is hardened by exposure. During this process, the mound of the colored layer 6 corresponding to the portion of the wave form becomes low, thereby improving flatness of the colored layers and black matrix (Fig. 2d).

2. Formation of colored layers by a "printing method" (Paragraphs 0075 - 0087, Fig. 3 of Warashina).

The process is similar to that of "pigment dispersion method".

As explained above, the object of Warashina's invention is to reduce asperities that are formed in a portion where the colored layers overlap the resin black matrix. Accordingly, as disclosed in Warashina, the invention is applicable to "pigment dispersion method" or "printing method" which requires mask patterns to form colored layers.

Differences over Warashina

On the other hand, the present invention is concerned with a problem of foaming generated when the dry colored film is bonded onto the substrate. Thus, Warashina's method of forming colored layers that involves masking differs from the method of the present invention by bonding and does not involve the problem solved by the present invention. In order to clarify this difference, claim 1 has been amended to include the step structure, which is disclosed as a solution to the foaming problem dealt with in the present invention.

Applicants request that the rejection of claims 1, 5, 6, 11, and 12 be reconsidered and withdrawn.

In addition, Applicants submit that a person skilled in the art would not be motivated to apply the technology disclosed in Warashina because the method for forming the colored layers is different from the bonding method of the present invention. The problems dealt with by Warashina are completely different from the problems dealt with in the present invention. Furthermore, even if a person skilled in the art would consider the teachings of Warashina, the person of ordinary skill would still be unable to solve the problem of the present invention.

At least for these additional reasons, Applicants request that the rejection be reconsidered and withdrawn.

Applicants submit that Sakamoto does not make up for the above stated deficiencies in Warashina. Thus, Applicants request that the rejection of claims 2-4 be reconsidered and withdrawn, as well.

CONCLUSION

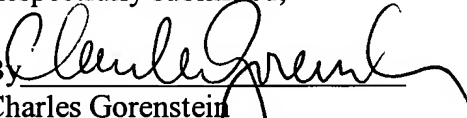
In view of the above amendment, applicant believes the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert Downs Reg. No. 48,222 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

Dated: October 12, 2006

Respectfully submitted,

By 

Charles Gorenstein

Registration No.: 29,271

BIRCH, STEWART, KOLASCH & BIRCH, LLP

8110 Gatehouse Road

Suite 100 East

P.O. Box 747

Falls Church, Virginia 22040-0747

(703) 205-8000

Attorney for Applicant